REMARKS

The application was filed on 05 December 2001 with twenty-one claims. The Examiner examined the application and on 09 September 2005 issued a first Action rejecting claims 1-10 and 12 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Application Publication No. 2003/0067934 A1 entitled MULTIPROTOCOL DECAPSULATION/ENCAPSULATION CONTROL STRUCTURE AND PACKET PROTOCOL CONVERSION METHOD to Hooper et al. (Hooper '934). The Examiner further rejected claim 11 under 35 U.S.C. §103(a) as being unpatentable over Hooper '934 and U.S. Patent No. 6,754,662 entitled METHOD AND APPARATUS FOR FAST AND CONSISTENT PACKET CLASSIFICATION VIA EFFICIENT HASH-CACHING to Li (Li '662). The Examiner also rejected claims 13-21 under 35 U.S.C. §103(a) as being unpatentable over Hooper '934 and U.S. Patent Application Publication No. 2002/0027901 A1 entitled APPARATUS, METHODS AND SYSTEMS FOR ANONYMOUS COMMUNICATION to Liu (Liu '901). Applicants responded, amended the independent claims, and cancelled claims 20 and 21.

The Examiner then issued a final rejection of claims 1-10, 12 under 35 U.S.C. §103(a) over Hooper '934 in view of U.S. Patent 6,075,790 entitled ASYNCHRONOUS TRANSFER MODE SYSTEM FOR, AND METHOD OF, WRITING A CELL PAYLOAD BETWEEN A CONTROL QUEUE ON ONE SIDE OF A SYSTEM BUS AND A STATUS QUEUE ON THE OTHER SIDE OF THE SYSTEM BUS to Lincoln et al. (Lincoln '790). The Examiner also rejected claim 11 under 35 U.S.C. §103(a) as being obvious over Hooper '934 in view of Lincoln '790 and further in view of Li '662. The Examiner further rejected claims 13-21 under 35 U.S.C. §103(a) over Lincoln '790 in view of Liu '901. The Examiner objected to claims 5 and 6. In response, Applicants amend claims 3-6 to overcome the objection, and traverse the substantive art rejections. Claims 1-19 are pending.

The Rejection of claims 1-10, 12 over Hooper '934 in view of Lincoln '790

The Examiner rejected claims 1-10 and 12 under 35 U.S.C. §103(a) as being unpatentable over Hooper '934 and Lincoln '790. The Examiner admits that Hooper '934 does not teach transferring the portion of the network data that are not modified to a next memory subsystem of the next processing element and then writing back the modified portion of the network data to the next processing element destination independently of transferring the nonmodifiable portion of the network data and bypassing the local memory. The Examiner asserts that Lincoln '790 teaches these limitations wherein the next memory subsystem of the next processing element destination is the host memory and the transmit FIFO 48. The Examiner further asserts that the Lincoln '790 also teaches writing the header to the next processing element destination independently of transferring the payload and bypassing the local memory.

Applicants respectfully traverse this reading and interpretation of Lincoln '790 by the Examiner; and consequently also traverse rejection of 1-10 and 12 under 35 U.S.C. §103(a) as being unpatentable over Hooper '934 and Lincoln '790. Applicants respond to the rejection by asserting that not only does Hooper '934 NOT teach transferring the portion of the network data that are not modified to a next memory subsystem of the next processing element and then writing back the modified portion of the network data to the next processing element destination independently of transferring the nonmodifiable portion of the network data and bypassing the local memory, but that Lincoln '790 also does NOT teach these claimed limitations.

As described previously in an Amendment under 37 CFR 1.111, Hooper '934 teaches a method and apparatus of modifying packets in a data processing network. A packet arrives into the apparatus of Hooper '934 which separates the header of the packet from the body of the packet as described by the Examiner.

The header of the packet is stored in SRAM of the processing element and the body or payload of the packet may be stored in a SDRAM of the processing element with additional space for a modified header. The main thrust of Hooper '934 is modification of the header of packet by encapsulating/decapsulating bytes according to flags which are determined by changing the communication protocol of the packet.

The Examiner agreed with Applicants that Hooper '934 does not teach these particular limitations of the independent claims but now asserts, and Applicants respectfully traverse, that Lincoln '790 teach the claimed elements of "writing back the modified portion of the network data to the next processing element destination independently of transferring the nonmodifiable portion of the network data, and bypassing the local memory" as in independent claim 1; of "forward[ing] the updated modifiable portion of the data packet to the bus interface that transfers the updated modifiable portion of the data packet to the interconnect fabric, independent of the portion of the data packet that need not be modified, to the next processing element system", as in independent claim 12; and "means to forward the modified portion of data directly to the next memory of the destination means bypassing storing the modified portion in the memory associated with the means to modify the modifiable portion of the received data" as in independent claim 15.

Lincoln '790 teaches receiving a data packet, separating the header and the cell payload, and then further teaches writing a cell payload between a control queue (control memory) on one side of a system bus and a status queue (in host memory) on the other side of the system (host) bus. The Examiner refers to Lincoln '790 at columns 3 and 4. Applicants have carefully considered the Lincoln '790 in its entirety and respectfully disagree with the Examiner's reading and understanding of Lincoln '790.

With reference to columns 3 and 4, and to Figure 2 of Lincoln '790, a cell packet, i.e., both the header and the cell payload, arrive into a receive FIFO of Lincoln '790; the cell header does not bypass the receive FIFO 34. The cell header (the modifiable portion of the data packet) and the cell payloads (nonmodifiable portion of the network data) are separated; the cell header is input to a control memory or control queue that provides addresses to store the payloads in the host or local memory. These addresses are then applied to direct the payload from the receive FIFO 34 to a host bus and "[t]he cells are then transferred in the host memory to the addresses indicated by the control memory," column 3, lines 39-41. Note that Lincoln '790 transfers the **cells** to the host memory. Note further that at column 3, lines 8-10, Lincoln '790 defines a cell as "fixed-length cell payloads **and** a cell header." Thus, the headers, i.e., the modifiable portions, as well as the cell payloads, are transferred to the host bus 44 and the host memory 32, contrary to the interpretation given by the Examiner that the modified headers bypass local memory. Further evidence is given by Lincoln '790 in Figure 2: note that from the reassembly DMA, block 36, both the data and address [stored in the header] are transferred to the host interface 42.

The Examiner further asserts that Lincoln '790 teaches the claim limitations of writing back the modified portion, the header, to the next processing element independently of transferring the nonmodifiable portion, the cell payload. Specifically, this time, the Examiner has again erred by equating the next processing element as claimed by Applicants as the transmit FIFO of Lincoln '790, and asserting that the header is transmitted to the transmit FIFO independent of the payload and thereby bypasses the local memory which the Examiner asserts is the receive FIFO 34.

Respectfully, Attorney for Applicants is confused. First, both the header and cell payload pass into the receive FIFO 34; so if the Examiner is equating the local memory with the receive FIFO 34, she/he is wrong when she/he states that the

header bypasses the local FIFO 34. A more accurate reading of Lincoln '790 is that both the host memory 32 and control memory 38, not the receive FIFO 34, comprise a local memory. But as Applicants have pointed out, Lincoln '790 teaches the header is modified in control memory/control queue 38 to generate an address for storage of the cells in local memory, the modified header is then applied to the reassembly state machine 40, then to the reassembly DMA 36, and then to the host interface 42 and finally across the host bus 44 to the host memory 32. As further evidence that the modified header is transferred to the host memory, Applicants again point out that in Figure 2 of Lincoln '790, an address is transferred to host memory. Applicants further wonder why the state machine and the DMA be referred to as "reassembly" components if the header and the cell payloads were not reassembled into a cell?

Applicants further traverse because neither the cell payload (an example of a nonmodifiable portion of the cell) nor the header (an example of a modifiable portion of a cell) are transmitted to the next processing element independently in Lincoln '790. Lincoln '790 specifically states "[t]he header is introduced by the control memory 38 to the segmentation state machine 50 for combination in the transmit FIFO 48 with the payload. The **recombined cell then passes to the transmit cell interface** line 45." Column 3, lines 51-55 (emphasis added). Yet, the Examiner does not equate the transmit cell interface as the "next memory subsystem of the next processing element destination [claim 1]", or "interconnect fabric [claim 12]", or the "next memory of a destination means [claim 15]"; the Examiner asserts that the transmit FIFO 48 is the next processing element. Respectfully, a more correct reading of Lincoln '790 by one of ordinary skill in the art is that the transmit cell interface, not the transmit FIFO 48, of Lincoln '790 is analogous to the interconnect fabric of Applicants. Note that Lincoln '790 specifically states that the cells, after recombination of the headers with the payloads in the transmit FIFO, are passed to the cell transmit interface line. Thus,

the Examiner's understanding that the next processing element or the interconnect fabric or the destination means is the transmit FIFO is in error and cannot sustain a rejection of the claims under 35 U.S.C. §103(a).

With respect to independent claim 12, the Examiner says that Lincoln '790 teaches that the receive cell interface [the receive FIFO] receives the data packet and sends the payload, which is not modified, through the data path to interface of transmit FIFO 48, and the path interface would be the interface fabric. Respectfully, the payload is stored in host memory before it is transmitted to the transmit FIFO 48. Lincoln '790 at column 3, lines 39-40 "directs the payload from the FIFO 34 through a host interface 42 to a host bus 44," and again at column 4, lines 24-26, "[t]he reassembly DMA 36 is then activated to transfer the cell payload from the receive FIFO 34 in FIG. 2 to the host memory 32 ....", not directly to the transmit FIFO 48. And at the transmit FIFO 48, the payload and the header are recombined before being transferred together to the transmit cell interface. So, the Examiner errs when she/he says that the payloads are transmitted from the receive FIFO to the transmit FIFO.

With respect to independent claim 15, the Examiner errs again when she/he asserts that "Lincoln et al. further teaches forward the cell header to the next memory of the destination means bypassing the control memory and reassembly state machine" [page 20 of the Final Office Action]. At column 3, lines 31-36, Lincoln '790 states, in direct contradiction to the Examiner's assertions, that "[t]he header in each cell passes to a reassembly state machine 40 for processing .... The header in each cell is introduced from the reassembly state machine 40 to a control memory 38 which processes the header to provide addresses that indicate where the cell payloads are to be stored in the host memory 32." The payloads and the modified addresses are stored in host memory; the headers are stored in control memory - both are stored in local memory. Respectfully, Applicants request the Examiner to reconsider the final rejection of

claim 15 as being obvious using a combination of Lincoln '790 and Hooper 934 because both references teach storing the modified portion of a cell in local memory.

Thus, Applicants' understanding of the references are that both Hooper '934 and Lincoln '790 explicitly teach storing the modified portion of the packet (the header) in a local memory before the recombined packet gets transmitted across a cell interface or interconnect fabric. Therefore, because neither reference teaches the claimed element of a modified portion bypassing local memory, certainly, their combination cannot teach it! Also, contrary to the claims, both Hooper '934 and Lincoln '790 teach recombining the modified portion (the header) and the nonmodified portion (the payload) before being sent to the next processing element system together. Again, if neither reference teaches that the nonmodified portion of a cell can be transmitted independently and separately from a modified portion of the cell, how can their combination teach it?

A hash caching policy of Li '662, moreover, does not complete the teachings of Hooper '934 and Lincoln '790 to render Applicants claim 11 as obvious because no cited reference teach the claimed limitation of independently transferring the modified and non-modified portions of a packet; nor do they teach that the modified portion bypasses the local memory before transferring to the next destination.

Similarly, a description of the variety of data types and protocols as taught by Liu '901 does not render Applicants' claims 13-19 as obvious because Liu '902, Hooper '934, and Lincoln '790, alone or in combination, do not teach the claimed limitation of independently transferring the modified and non-modified portions of a packet; nor do they teach the modified portion bypassing the local memory before transferring to the next destination.
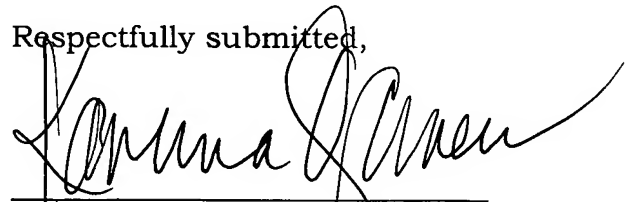
Conclusion

Applicants have overcome the alleged combination of Hooper '934 and Lincoln '790 to render the claimed invention as obvious by asserting that the Examiner misinterpreted Lincoln '790 differently than how one of ordinary skill in the art would construe Lincoln '790. The Examiner admits that Hooper '934 does not teach the claimed elements of a modified header bypassing local memory before being transferred to a destination next processing element; and that Hooper '934 does not teach the claimed elements of transferring the non-modified portion (the body or payload) of a data packet to the next processing element destination independent of transferring the modified portion (the header) of a data packet to the next processing element destination. Now, Applicants traverse the Examiner's rejection of Applicants' claims 1-10 and 12 as being obvious under 35 U.S.C. §103(a) because one of ordinary skill in the art would not consider the receive FIFO of Lincoln '790 to be a local memory; nor would one of ordinary skill in the art consider the transmit FIFO of Lincoln '790 to be a next/destination processing element. Applicants specifically state that the claimed invention addresses the novel and nonobvious realization that a modified header need not be written back to a local memory because the payload associated with the header has already been transferred; Lincoln '790, on the other hand, specifically teaches that the modified header and the cell payloads are written to a local memory and that address coherency is maintained between the status queue in host memory and the control queue of a control memory. Further the combination of Li '662 (hash caching policy) or Liu '902 (a variety of data protocols) with Hooper '934 and Lincoln '790 does not provide the requisite teachings or suggestions to render Applicants' claimed invention of claims 11, 13-19 as obvious under 35 U.S.C. §103(a) in light of the shortcomings of Hooper '934 and Lincoln '790 to teach independent transmission of the nonmodifiable portion of a cell from the modifiable portion of the cell.

Attorney for Applicants thank the Examiner for her/his review of the specification, the figures, and the claims. Having reviewed the art submitted by the Examiner, Attorney for Applicants requests the Examiner to enter the amendments to overcome the objections of the Examiner. Applicants further request the Examiner allow all claims. The Examiner is further invited to telephone the Attorney listed below if she/he thinks it would expedite the prosecution and the issuance of the patent.

Respectfully submitted,

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